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Integration of Web 2.0 Tools in to Non-formal Learning Practices: A Case Study of IBM

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Abstract

This research identified the specific benefits of online collaboration tools, and explored how their usage has been appropriated by employee volunteers for their practice of volunteering and how they influenced the process of their meaning-making. By doing so, it raised an awareness of the digital tools that provide collections of traits through which individuals can get involved in non-formal learning practices by having digital interactions with others.

Keywords: digital learning, IBM, volunteering, Web 2.0, e-collaboration, blog, wiki

1. Introduction

This study provides an insight into how online engagement enabled the continuation of non-formal workplace learning practices such as volunteering and opened up possibilities for new ways to contribute to the learning process of employees. Today's workplace settings are in constant need of recurrent learning processes interwoven with daily tasks on digital spaces. However, these digital spaces are not devoid of any issues and hence suggest the need for employees to be conscious of the emerging issues. As every knowledge-intensive entity needs to support their employees' development in non-classroom and non-instructional type of learning the crucial aspect of digital applications in terms of contributing to related processes of knowledge creation by fostering collaboration

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needs an emphasis. While doing this I reflect upon the strategies adopted in alignment with the umbrella term of "Web 2.0".

This research study explores how online communities are created by employee volunteers and also provides an understanding of non-formal learning practices within such fluid settings; important issues for organizations interested in non-formal learning practices of their employees are also being raised.

The study conveys a context-driven collaboration model focusing on learning through collaboration throughout a volunteering programme. This volunteering program matches communities' needs in the developing world to IBM employees' learning processes in a collaborative and integrated manner. This volunteering model involves a decentralized, employee-generated learning process that is driven by collaboration with colleagues, online resources and experts within the organizational setting in IBM. I identify the affordances of various digital tools from the perspective employee volunteering, and how these affordances can be leveraged to support employee choice and autonomy. The volunteers made a decision for using these online collaboration tools on their own without being under the influence of any institution, and based on their own needs and ideas they utilized these tools. In addition to being a generic space for sharing documents, the digital environment serves as a joint place populated and created by the volunteers to navigate through information, find personal routes and pathways. This set of tools provides contextual information in a seamless manner based on the learning needs of the IBM employees. My inquiry in this thesis related to different volunteering cases that deal with the changing usage patterns. I delve into the collaborative processes facilitated by the use of digital tools within their volunteering context, in other words, whether and how volunteers were supported by the content conveyed to them via means of relevant digital assets and tools. The volunteering setting embeds aspects of both virtual and physical parts of workplace learning.

2. Literature Review and Conceptual Work

The last decade has been witness to a shift from the individual to the constructive and social aspect of knowledge in the existing epistemologies (Easterby-Smith & Lyles, 2003). Such a direct shift of focus onto the social nature of meaning and practice can result in the redefinition of the organisation itself as a community of practice (CoP), with organisational dimensions that convey meaning to these practices meaning.

The prominent scholars Lave and Wenger who firstly made a definition of CoP in their famous book with the title "*Situated Learning: Legitimate Peripheral Participation"* studied how situated learning takes place as a result of the relationships built by "master practitioners" and "newcomers". CoP 's can also refer to places in which which "communicative action" occurs (Polanyi, 2002). The mutual creation of knowledge mediates these actions (Wenger, 2004). While CoP's function as a ground for knowledge creation and transfer (Lesser & Prusak, 2000; Wenger, 2004; Wenger & Snyder, 2000) they exist at the crossroads of intellectual and social capital. Within the current body of literature it is a common belief among scholars that CoP's support the basis of social capital, which is mandatory for creating knowledge and its dissemination (Lesser & Prusak, 2000, p. 124).

According to Wenger (1999), CoP framework can be implemented within both "intra" and "inter" dimensions of organizational settings due to being "an integral part of our daily lives" (Wenger, 1999, p. 6, 7). Building further upon the concept of CoP, Wenger utilized it to establish a comprehensive theory of how individuals within collective settings such as organizations work together (1999; 2000; 2004). In his book, *Communities of Practice: Learning, Meaning, and Identity*, Wenger (1999) states that organizations can be considered as assemblies of CoP which can reach even beyond their confines and be situated either within or between formal networks (1998, p. 30). In addition, some scholars utilized the concept of CoP to put cross-sector collaborations under scrutiny (Lathlean & le May, 2002; Dewhurst & Navarro, 2004). These scholars have also contributed to my motivation for approaching the CSC Program from the perspective of CoP. These studies suggest that organizational initiatives provide a fruitful ground to implement the CoP theory.

The term "joint enterprise," referred to as the shared purpose of practitioners in a particular field is used as one of the main characteristics of a CoP (Wenger & Synder, 2000). Similarly, according to O'Donnell *et* al (2003) CoP's are formed around a common interest established upon the values of their members. These shared interests are set into a negotiation on a communal basis (Wenger, 1998, p. 78) around a common purpose. Wenger (1998) describes a "practice as a process by which meaning is provided for one's engagement within the world" (p. 51). According to Wenger (1998), "mutual accountability" (p. 81), which refers to the degree of reciprocal relationship among its members, acts as a glue in terms of holding these joint enterprises together. The "shared repertoire" is another feature underpinning CoP (Wenger, 1999, p. 82) and this "shared repertoire" includes the tools and techniques in order for negotiating the meaning and making learning happen (Wenger, 1999). Possible forms for this repertoire range from an informal discussion during a coffee break to a structured meeting based on some decision-making

criteria. According to Wenger & Synder (2000), as CoP's often have connotations to business units or teams; additional effort is required to integrate them into organizational settings in order for their power to be realized (Wenger & Snyder, 2000).

IBM's CSC employees can be considered as communities of voluntary practitioners and their means of communication should also be taken into account. These means of communication range from face-to-face interactions to the use of various digital tools. In other words, it is not sufficient to focus only on the individual elements of the CSC Programme such as the volunteers or online collaboration tools, but in particular on their mutual interplay. Crossan *et* al. (1999) states that one of the main barriers against theory development with regard to any organizational practice is whether the unit of analysis should be individual, group, organizational and/or interorganizational. Furthermore, some theorists assert that an organizational practice would not be complete without the sharing of information and the development of common meaning (Daft & Weick, 1966; Huber, 1991; Stata, 1989). Consequently, as an organizational practice must be shared and integrated with the learning done by others (Brown, 1993; Daft & Huber, 1987; Daft & Weick, 1966) the unit of analysis should be the group. Other scholars assert that the unit of analysis should be the organization itself as much needs to be done by organizations themselves due to the fact that the activity is stored with organizational structures, procedures or systems (Duncan & Weiss, 1979; Hedberg, 1981; Shrivastava, 1983; Fiol & Lyles, 1985; Levitt & March, 1988; Stata, 1989; Huber, 1991; Chi-Sum *et* al., 2008). By taking into account these theoretical perspectives, the unit of analysis of this study will be the group as it focuses on the different CSC groups made up of IBM employee volunteers.

2.1. Literature about CSCL

Any academic discussion of online collaboration involves the practice and theory of CSCL (computer-supported collaborative learning). While the focus of much current CSCL work with regard to workplace learning is rooted in workplace interaction, we should keep in mind that contrary to popular belief, CSCL could especially make a difference when it comes to learning outside the boundaries of organizational settings. So, apart from the daily work practices of individuals, the social "situatedness" of learning (Winograd & Flores, 1986) should also become the focus of these discussions (Lave, 1988). Due to the adoption of such an alternative approach "outside-class" activities are considered as a crucial aspect of the social background with regard to the process of learning (Cole & Griffin, 1987).

From the theoretical perspectives of CSCL, learning should be assessed on the group level while technology can support the group processes: According to Scardamalia and Bereiter (1996), the community learns as a whole in a computer-supported learning community while the term "community" itself needs a re-conceptualization taking into account the definition provided by Lave and Wenger (1991). Engeström (1999) took a wider learning approach and studied how learning occurs during the interaction of multiple groups among each other. Stahl (2001) claims that these theoreticians (e.g: Lave, 1996; Engeström, 1999) derive their social theories based on Hegel (1967), Marx (1976) and Vygotsky (1978) and that these CSCL theories are disputative due to the increasing complexity of the history of philosophy and theory since the times of Descartes. According to Kant (1787), our conceptualization of the outer world was represented by the human mind, which involves a basic structure rather than being simply given by the material world. Hegel (1807) adopted a developmental view and grounded the process of representation in changes throughout the history. According to Marx (1867/1976), these changes are grounded within socio-economic phenomena. Later on, another famous scholar, namely Heidegger (1927), suggested another perspective in which the human being is more firmly situated in the world than Descartes' approach. Figure 1 shows a graphical representation with regard to the different social and individual theories of learning.

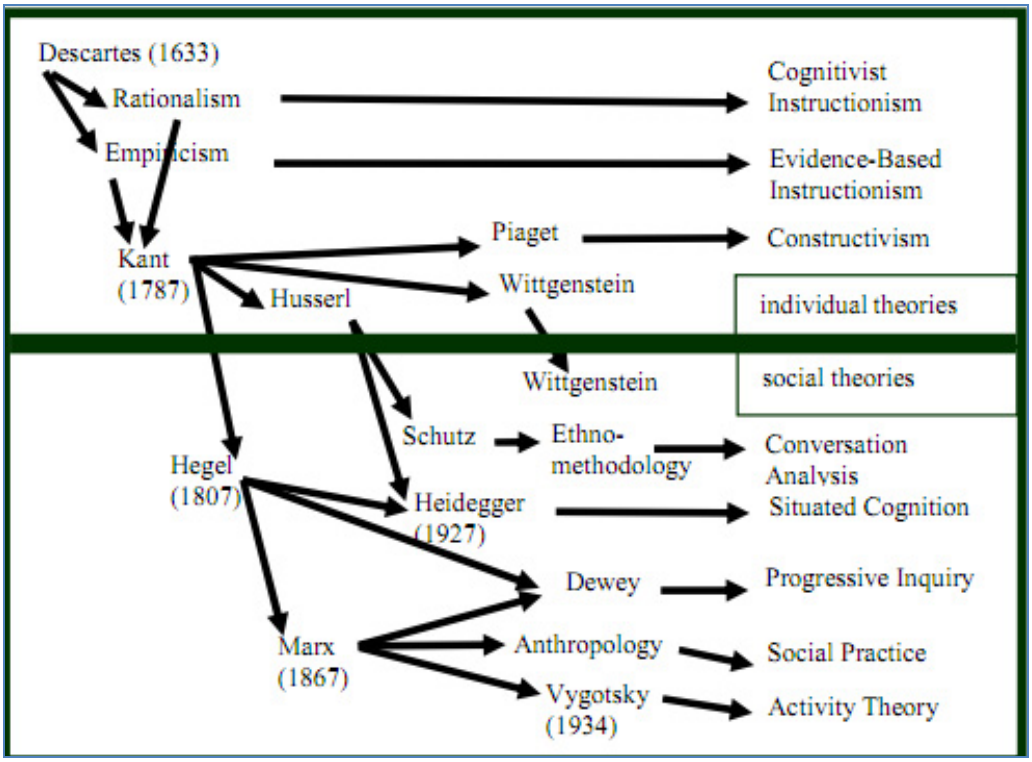

Fig 1. Graphic representation of individual and social theories of learning (Stahl, 2001)

Taking into account these individual and social theories of learning there are two main approaches of defining CSCL:

According to the first perspective, CSCL can be seen as an "umbrella term" which provides a fertile ground with regard to the development of multi-faceted perspectives on related topics. In fact, this approach provides a further ground for the creation of many new research areas such as Computer Supported Cooperative Work (CSCW) (Bannon et al., 1988, Bannon & Schmidt, 1992).

The second perspective is related to understanding the related problems and concerns in detail and establishing a shared understanding on the object of study which would further contribute to the development of the field. As there is no unified definition for CSCL, a compositional perspective might be taken in which the meaning of the term is built from its components. So, possible questions that can be asked include what do people mean by collaboration or learning and by CSCL. Rather than imposing an exclusive interpretation on the meaning of CSCL, the focus of research can shift to workplace learning, in this case to the specific initiative of employee volunteering, and how it might be supported by the online collaboration tools.

Table 1 provides the differences between traditional and collaborative learning as explained by Mandl & Krause (2001). A constructivist learning theory underpins the concept of CSCL. According to this theoretical approach, learning involves a process guided on one's own which requires a conscious knowledge creation and hence the previous experiences, skill set and mindset of the individual influence this process (Mandl & Krause, 2001). Additionally, there is a second constructivist approach with regard to knowledge-sharing: "to solve problems in a self-organized way" (Arnold & Schussler, 1998, p. 78). Within this regard it is crucial for organizational stakeholders that different types of learning are facilitated by supporting learner-oriented, social and situative learning (Mandl & Krause, 2001).

Table 1. Differences between the traditional and collaborative e-learning model (Mandl & Krause, 2001)

	Traditional Approach	Collaborative Approach
The objective of learning	Being qualified for expertise	Skill
Know-how	In progress, memorized	Construed
Paradigm	Solving a problem, gaining an understanding	To enhance related experiences and practices
Technology use	Dissemination	Communication, learning in collaboration
The mode of involvement for learner	The metaphor of acquisition metaphor	The metaphor of participation Dynamic and complex model
Interaction type	Delivery model	

Timothy Koschmann, one of the prominent scholars in this field asserted that this shift in pedagogical models due to the use of technology represents the start of a new paradigm according to the Kuhnian perspective (Koschmann, 1996). Koschmann (1996) further stated that with CSCL the emphasis shifts from the personal development onto the group cognition and due to the incompatibility of this perspective with the conventional view which is more individualistic, it meets the requirements of a new paradigm as determined by Kuhn (1962).
In my view, rather than trying to come up with a unified approach for empirical research in CSCL researchers should focus on how individuals collaborate with digital tools which might also be relevant for the CSC Programme. In my point of view, the aim should be to elaborate on the ways of using these tools in an effective way in order to obtain the commonly shared goals which is one of the underlying features of collaboration.

3. Research Methodology

This section discusses the key research questions, the overall methodological approach, the design of the study and research methods and strategies as well as ethical issues, and a short precursory description of data analysis planned including a pilot study.

3.1. Research Questions

The study aims to answer the following research questions:

- How are collaborative learning tools used for the volunteering practice of knowledge workers?
- What are their assumptions about the benefits and challenges in using these tools for such a practice?

In conceptualising the participatory nature of this research study, I have derived my approach from the framework offered by Fajerman and Treseder (2000) that specifies six different ways for involving participants ranging from no involvement at all to the involvement of the participant initiated on his own or based on decisions shared with the researcher. The methodology used in this study belongs to the group of “consulted and informed” as defined by Fajerman and Treseder (2000), in other words I as a researcher designed the study while the participants’ opinions are taken seriously. Needless to say, the participants are informed of the complete research process (See Figure 2).

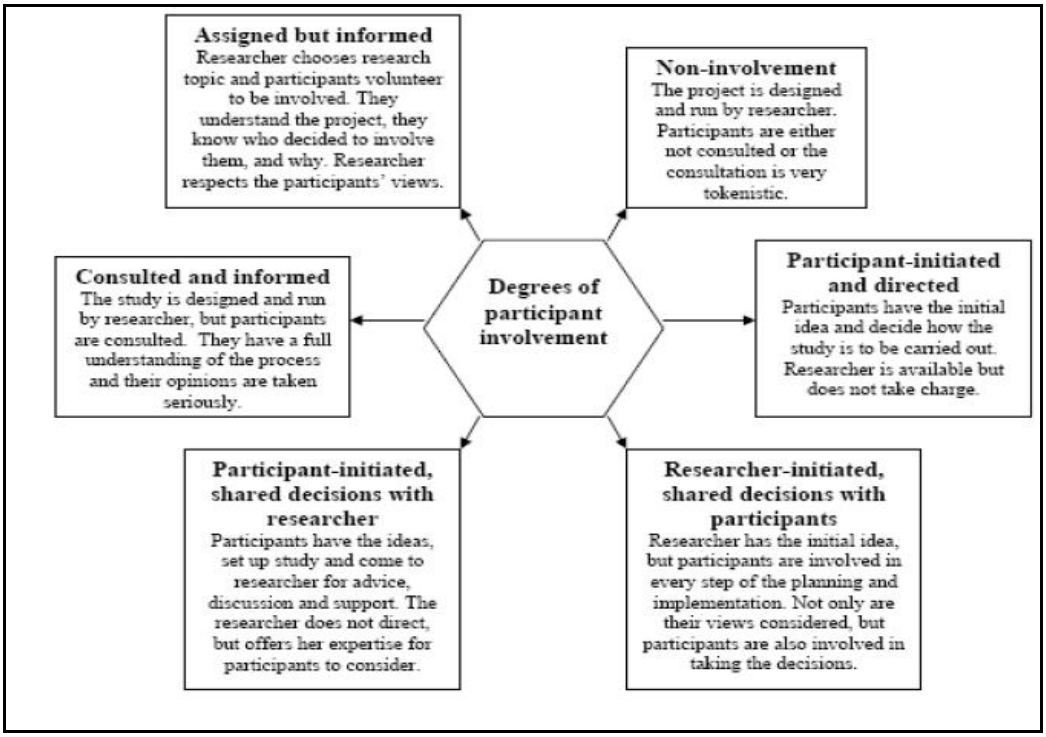

Fig 2. Fajerman and Treseder (2000)'s model for levels of participant involvement

3.2. Data Collection

Data collection has the following main sources:

- information based on the online survey,
- digital artefacts such as blogs and wikis and
- transcripts from the interviews.

The data collection methods of this research study include an interview an online); and review of digital artefacts all of which have been utilized in both participatory design and related participatory research. A cross table in order to match the online survey and interview details was developed. Table 2 provides the data collection methods based on each stage.

Table 2. Breakdown of data collected

Stage One- context	Stage Two- case studies	
Survey	Interviews	Digital artefacts
12	17	30

3.3. Data Analysis

To conduct the quantitative data analysis, SPSS was used while for qualitative analysis Excel was used by separating content into appropriate sections and manipulating it. Open comments provided about the answers were put into an additional column in the Excel file. In order to see whether some general patterns emerge an overall descriptive analysis was conducted based on the available dataset. A further analysis of these patterns showed whether there were differences among the volunteers. Based on the emerging patterns I coded the qualitative data and ranked the results or directly quoted to support the quantitative findings.

After data collection at the level of individual participants, I tried to put each case study into analysis individually followed by an overarching study across the cases (study of cases). The main purpose of the qualitative data analysis was to extract and abstract from the complex data any evidence with regard to the activities and experiences with online collaboration tools to convey responses to the research questions. I transcribe relevant extracts from the interviews to supplement the results of the survey. I used this analysis to convey more detailed information about the

approaches that the participants put into use and in which ways the tools had an impact on both their approach to collaboration and their knowledge-sharing activities.

For further analysis, all verbatim transcripts of the online interviews with the interviewees were imported into NVivo. Table 3 provides an overview of the alignment of suggested coding categories with research questions and interview questions. Digital artefacts such as entries into the CSC Programme wiki, blog or Lotus Notes tools served as supporting sources. The themes and the categories to which they belong have been changed in case of any differences until a common agreement has been reached among the participants.

Table 3. Overview of the alignment of the suggested interview coding categories with research questions and interview questions

Research Questions	Mapping with Interview Questions	Mapping with an Interview Coding Framework
How are collaborative learning tools used for the volunteering practice of knowledge workers?	1. How does your organization make an effort to contribute to the usage of online collaboration tools during the CSC Programme? 3. How many times in a day do you use any of the online collaboration tools to exchange information with your colleagues and other related individuals involved in this CSC Programme? Please give me some examples of what you use and how you use it. 8. What are the factors that can contribute to your engagement with online collaboration tools? 10. Is there anything else about your use of online collaboration tools that I could have asked you? Or anything else you would like to add?	DESCRIPTIONS OF USAGE (i.e. where participants describe how they use online collaboration tools throughout the CSC Programme) CHOICES ABOUT APPROACH: Reasons why participants use online collaboration tools throughout the CSC Programme
What are their assumptions about the benefits and challenges in using these tools for such a practice?	2. What are the main factors that allow/limit your organization to facilitate the use of the use of online collaboration tools within this context? 4. What are the main factors that allow/limit your organization to facilitate the use of the use of online collaboration tools within this context? 5. Are there any downsides to using online collaboration tools for professional knowledge-building and sharing? For example? 6. Do you think using technology – specifically for collaboration in this CSC Programme can be improved? Please give specific examples. 7. What are your key concerns of the use of online collaboration tools in relation to knowledge-sharing? 8. What are the factors that can contribute to your engagement with	FEELINGS ABOUT USAGE (confidence, difficulties, concerns) SUPPORT- SOURCES (who provides the support; influential people) SUPPORT- NATURE (what kind of support) SUPPORT- EVALUATION (how useful or effective was the support perceived to be)

online collaboration tools?

4. Results

In line with the approaches above the CSC participants devise and adopt a variety of approaches when using technology to support their volunteering process. The most common types of approach adopted by participants seem to be related to sharing of experiences, knowledge and best practice which can establish the ground for encouraging the use of online collaboration tools. These are outlined in Table 4.

Table 4. Overview of the types of approaches used by CSC volunteers

Volunteers' Approaches	Examples
Having co-presence/ Sharing experience, knowledge and best practice	Using Instant messaging; participating in discussion forums; or uploading videos or photos onto the Internet
Meeting new colleagues and experience parts of the world	Having discussions through Lotus Notes communities and tracking the experience of the participants
Navigating through information, find personal routes and pathways	Using internal Lotus Notes platform
Increasing one's knowledge on CSC Programme	Using Edvisor especially before leaving for fieldwork
Reflecting on one's experiences	Blogging
Accessing, creating, sharing and continually improving ideas	Participating in exchange of ideas via blogs and wikis
Participating in networks of distributed volunteers engaging in activities	Using popular Web 2.0 tools such as Ning, FaceBook
Facilitating ongoing communication, dialogue and shared activity	Creating digital artefacts
Supporting one's learning process	Attending online trainings on culture, security and literature reading on social responsibility projects online
Receiving informal support	Using Skype or MSN to communicate with others
Aiming toward a common goal of knowledge creation	Participating in exchange of ideas via Lotus Notes communities, e-mail and wiki
Participating in a team evolution process	Observing others' online behavioural pattern on discussion forums or the wiki
Supporting online communities and relationships between people	Participating in Lotus Notes communities
Having a more authentic collaboration through the creation of digital artefacts	Posting mainly on blogs or contributing to wikis
Recombining the information shared by others to create new concepts, ideas, and services	Utilizing Web 2.0 tools (mostly blogs and wikis)

At the heart of the CSC Programme lies the process of project-based learning that enables the individuals to gain a shared understanding and construe a common basis for knowledge creation. This does not necessarily leave aside individual contributions and perspectives, yet volunteers are not required to segregate their work into discrete tasks to be completed individually and bring them together later on. Rather, they are required to make contributions to the point of views of their team mates for the mutual negotiation of meaning and the joint construction of a project by using online collaboration tools (Roschelle & Teasely, 1995). Coordination is a necessary element only when putting together the partial results of the discrete tasks of the related project (Roschelle & Teasely, 1995). On the other hand, the construction of a joint project through genuine collaboration necessitates a coordinated effort for a joint problem-solving (Roschelle & Teasely, 1995). It involves an interactive process that requires the participation of all group members for mutual negotiation and sharing of ideas (Roschelle & Teasely, 1995).

All these factors displayed in Table 5.0 lead to the emergence of a new volunteering practice that I call as 'distributed' or 'technology-enhanced' volunteering. It is the amalgamation of the social affordances of digital tools, with new informal learning goals and priorities that provide an opportunity for metamorphical shifts in employee volunteering practices.

Table 5 Mapping between research questions and the findings

Research question	Findings	Sub-themes
How are collaborative learning tools used for the volunteering practice of knowledge workers?	While connection is about enabling a space for activities co-presence is about requiring that everybody participate in these activities.	Usage & Approaches Strategies/Choices Feelings
	Informal and formal distributed cognition are apparent throughout the CSC project.	Usage & Approaches Strategies/Choices
	Through participation in these forms of discussion and interaction, volunteers are provided with the ability to construct their own informal learning trajectories as well as shaping pro-actively those of others. This observed distributed cognition among CSC volunteers as supported by online collaboration tools directly leads to the temporary construction of one or more group minds.	
	Intersubjectivity is obtained when there is a shared ownership of the activity and a common conceptualization about the objective as a result of the collaborative redefinition of that activity. So, perspectives are negotiated on an ongoing basis.	Usage & Approaches
	The perceived benefits of online collaboration tools can also engender epistemic fluency (Goodyear & Zenios, 2007) which allows volunteers not to underestimate the complexity of existing ideas, norms and practices.	Usage & Approaches Feelings
	Evidence of both interdependent use (using the tools for the purpose of collaboration), independent use (e.g: independent use of tools for other purposes than collaboration) are evident throughout the study. Such practices do not often conform with the norms and practices of the conventional volunteering practice. Individual traits such as personal values act as a mediator for the methods of collaboration and learning in social contexts, such as digital environments.	Usage & Approaches Choices
	Interrelations among the values of the participants and the digital actions give form to the individual engagement within the collaborative practice of volunteering.	
	Volunteers' participation in digital collaboration should not be assumed as being certain. Meaning and value are important for what is afforded for them to participate in online conversations and learn. So, there are different kinds of invitational qualities required such as the ability to make reluctant participants get involved in conversation and support them for finding a meaning through their participation in ways that enable the transformation of existing values and practices.	
	Given the situatedness within the context of relations and distributed volunteering networks, the volunteering experience requires a certain amount of commonality in order for collaboration to take place.	Usage
	The main challenges were how to find meaningful insights, to decide for the individual roles and responsibilities as well as the delicate balance of internal and external capabilities.	Feelings

What are their beliefs about the benefits and challenges in using these tools for such a practice?	Two individual aspects that appeared to influence participants' decisions about technology use are: • A tendency to participate in a shared endeavour; • A feeling of co-presence	Choices Use & Feelings
	Retention of the co-presence and eventedness, involve to some degree retaining the volunteer's perspective.	Usage & Feelings
	One of the key affordances of various tools used throughout the CSC Programme is its collaborative affordance. That is, the tools have properties that allow them to be used to collaborate. Although the tools were not mainly designed for the purpose of learning, volunteers perceived its potential to support learning.	Usage & Approaches Choices
	The tools cannot be used for arriving at a precise decision.	Critical moment Feelings & Assumptions
	The clarification of mutual roles and responsibilities is essential to effective utilization. Some participants mentioned that receiving informal peer support is an important alternative to receiving timely formal support.	Feelings & Assumptions Support
	Participants equipped with various levels of expertise and areas of interests nourish the volunteering environment with ideas and knowledge that are befitted by volunteers based on their needs. Expertise is therefore distributed amongst all volunteers. Given the 'transformative' nature of such interactions (Pea, 1994), individuals acquire more expertise as the dialogue unfolds and they co-construct knowledge. There is also the opportunity provided by the online collaboration tools to go through a team evolution process and recognize common patterns in communication styles of group members.	Choices Usage & Feelings
	Some participants expressed some issues of concern such as privacy. Still some of the participants indicated they would collaborate without technology, but they would prefer not to. Commitment to joint work comes from those we know well and trust -- our strong ties in social network terms. Thus, according to Haythornthwaite (2008) e-learning settings also need to support strong tie formation in order to get work done.	Choices Usage & Feelings
	The different tools enabled the volunteers to navigate through information, find personal routes and pathways.	Usage Choices Skills

The volunteers are also endowed with a flexibility that enables 'collaborative remixability' (Boyd, 2007) – a transformative process which denotes the state of the information which can be recombined to further develop new concepts, ideas, and services.

Usage & Approaches Choices Skills

As the tools can offer individuals access to crucial components of knowledge related to their volunteering projects, it is important that these tools are highly invitational.

A more liberated definition of community occurred derived from the notion of social networks with an emphasis on social ties rather than geographic location. These virtual communities are place independent, liberated from geography and dependent on technology.

In CSC Programme, online interaction support offline geographically dependent communities whereas online interaction and engagement go hand-in-hand with overall civic engagement. Also, by using information and communication technologies to improve communities community informatics becomes more important.

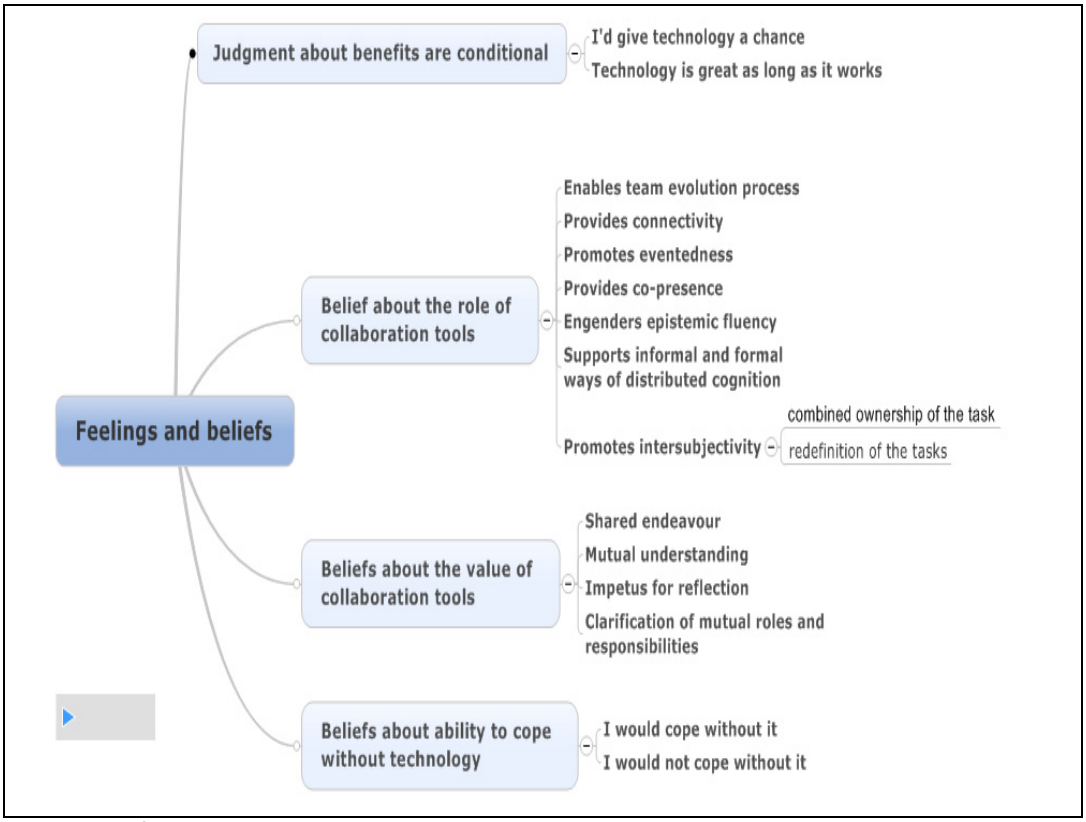

Fig 3. Samples of answers to interview questions

According to Selwyn (2006), who came up firstly with the term "digital decisions", when individuals make empowered decisions to use or not to use technology, they exercise a genuine choice by taking into account its relevance, usefulness or even happiness caused by its usage throughout their everyday lives (Selwyn, 2006).

The choice for not using the technology is also evident in the CSC data. One of the underlying reasons for not using the technology was no being able to “get on with them”. It is also evident from the data that several CSC volunteers think that it is up to them to take refined and complicated decisions for the usage of digital tools to aid their volunteering practice. The affordances and features of digital tools mainly underlie this decision-making process in addition to other factors.

The results from the study suggest that the opportunity of both being provided with a feeling of co-presence and eventedness are reasons why participants liked using online collaboration tools mostly CSC participants mentioned that the feeling of belonging to a networked community of colleagues sharing resources and asking for support the value of peer support is also an influential factor

Finally, if there were a particular amount of dependence on collaboration tools due to the assumption that it facilitates an easier collaboration; CSC participants preferred to refer to specific aspects and stated their views in a confident manner, rather than just being in favour of a particular tool or using it.

5. Conclusion

Technologies can provide many possibilities, but they cannot “fix” meanings (Suthers, 2005). Based on this fact, this research identified the specific benefits of online collaboration tools, and explored how their usage has been appropriated by employee volunteers for their practice of volunteering and how they influenced the process of their meaning-making. By doing so, it raised an awareness of the digital tools that provide collections of traits through which individuals can get involved in non-formal learning practices by having digital interactions with others.

It would be disingenuous and naïve of me to promise that the research study will by itself transform the online collaboration experiences of all users. I do however argue that the finding of this research study would increase an awareness amongst institutional stakeholders interested in the practice of employee volunteering to take further action and to provide direct responses to what the participants have said and done.

Furthermore, the concept that the process of employee volunteering should make a shift from the conventional model that has been depicted through this research study and elaborates that participants have created a variety of refined and customized strategies for putting the digital tools into practice to aid their process of collaboration. I assert that the most pragmatic way to view online collaboration tools with respect to supporting employee volunteering or other non-formal learning practices is to consider it an enabling medium through which the individuals can structure and complete their activities. The possibility of making use of the tools to reach beyond the individual volunteering activity and facilitate access to other contexts of activity which can be reciprocally supportive breaks down some of the employee volunteering stereotypes that have been moved back and forth for such a long time.

One of the main challenges faced during technology-enhanced volunteering programs will be the composition of the available digital tools and activities so that each tool can be utilized for its affordance. Despite the fact that this study has taken a step in that direction, there is certainly a need for more studies about what works and what does not in a project-based learning environment. The alignment all the affordances in such a way that volunteers gain an understanding of them and make use of the many affordances can be difficult. So, online collaboration tools should better be distributed within the network of volunteers and embodies within their practice of volunteering so that volunteers have more opportunities to realize and take benefit from the affordances of the digital tools. For this purpose, a thorough structuration of the complete environment and the various actors within that context are required: volunteers, digital tools, digital resources and other project stakeholders such as managers.

In the final analysis, the incorporation of online collaboration tools into the CSC Programme is about change in the way the volunteers collaborate with each other, not about technology. This collaborative phenomenon raises the point about socio-technical systems thinking, which stipulates that technology in itself has little meaning. Within the context of employee volunteering, technology gains its value with regard to the collaborative interactions of the volunteers. It’s about people and their behavior, not computers. It is about inventing new visions of employee volunteering in the context of a digital world. While the lack of online collaboration tools is a barrier to change, the presence of these tools does not guarantee change.

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